## ABSTRACT

A commutation and velocity control system of a brushless DC motor receives a velocity command signal and provides command signals to drive the brushless DC motor. The system includes a summer that receives the velocity command signal and a velocity feedback signal and provides a velocity error signal indicative of the difference. A velocity loop compensator receives said velocity error signal and provides a compensated velocity error signal. A magnitude sensing circuit senses the magnitude of said compensated velocity error signal and provides a velocity magnitude signal indicative thereof. A polarity sensing circuit senses the polarity of the said compensated velocity error signal and provides a velocity polarity signal indicative thereof. The system also includes an integrated circuit having: (i) a velocity calculation circuit that receives a first sampled digitized signal indicative of resolver position at a first time and a second sampled digitized signal indicative of resolver position at a second time, and determines velocity based upon the difference between said first and second sampled digitized signals and provides a sensed digitized velocity signal indicative thereof; (ii) a commutation logic circuit that receives said first sampled digitized signal, said velocity magnitude signal and said velocity polarity signal, and provides said command signal; and (iii) a counter that receives a signal indicative of said sensed digitized velocity signal and provides a pulse width modulated output signal indicative thereof. A filter receives said pulse width modulated output signal and generates said velocity feedback signal.